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09/830,824	06/28/2001	Dario Cardini	3606-0117P	2168
2292	7590	03/29/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			PEZZLO, JOHN	
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			2662	

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/830,824

Applicant(s)

CARDINI ET AL.

Examiner

John Pezzlo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 13-21 is/are rejected.
- 7) ☐ Claim(s) 7-12 and 22-27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1 May 2001</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1, 11, and 13 are objected to because of the following informalities:

1. Regarding claims 1 and 13 – Lines 5 and 6 - The claims state "the possibility to share a residual band possibly available on the same flow ". This statement needs to be stated in a positive explicit matter, for example.... When residual bandwidth is available the unused bandwidth is made available to the other flows on the output link.... Appropriate correction is required.

2. Regarding claim 11 – Claim 11 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 11 depends from both claims 9 and 10 and claim 9 is already a multiple dependent claim. See MPEP § 608.01(n). In order to provide an action on the merits it is assumed claim 11 depends from claim 10.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

I. Claims 1-6 and 13-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Daniele et al. (EP 0843499 A2) hereinafter Daniele.

1. Regarding claim 1 – Daniele discloses a method for the statistical multiplexing of flows of ATM cells originated by connections having different quality service classes, said flows generating transmission queues of cells (QUj) shared into functional blocks (Bi,...Bm), and to some of said flows at least being assigned a minimum guaranteed band on the multiplexed flow, (LINK-OUT) and the possibility to share a residual band possibly available on the same flow through a function, hereinafter called Weighted Fair Queuing, or WFQ, which dynamically assigns opportune quantities of tokens, evaluated on statistical basis, to single transmission queues (QUj), that spend said tokens to have access to the residual band on the multiplexed flow (LINK-OUT), characterized in that said WFQ function includes dynamic assignment phases of opportune quantities of tokens, evaluated on statistical basis, also to said functional blocks (Bi,...Bm), that spend said tokens to enable their transmission queues (QUj) to have access to the sharing of the residual band on the multiplexed flow (LINK-OUT), thus sharing among said functional blocks (Bj) the residual band on the multiplexed flow, refer to Figure 1 and column 2 lines 18 to 22 and column 3 lines 33 to 45 and column 5 lines 5 to 37 and columns 6 and 7.

2. Regarding claim 2 – Daniele discloses the phases of said WFQ function are cyclically repeated with renewal period of the cycle (TR) multiple integer of the transmission time of a cell (Tc) on said multiplexed flow (LINK-OUT), refer to column 5 lines 30 to 50.

each cycle including the following steps:

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a) assigning (INIZIALIZZA TK-CNT1,...,m) to at least some of said transmission queues (QU1, ..., QUz) a relevant number of tokens ( $N^0\text{TK}(QU1)$ , ...,  $N^0\text{TK}(QUz)$ ) proportional to the band of the relevant said flows,

b) assigning (INIZIALIZZA TK-CNT-B) to at least some of said blocks (B1, ..., Bm) a relevant number of tokens, ( $N^0\text{TK}(QU1)$ , ...,  $N^0\text{TK}(QUz)$ ) proportional to the aggregate band of the relevant component flows,

c) sharing (INIZIALIZZA FIFO WFQ-B) the indicators (B-ID) of blocks including transmission queues awaiting to be served in a high priority list (HP-FIFO), a low priority list (LP-FIFO), and a very low priority list (VLP-FIFO) belonging to a first set of lists (WFQ-B) controlled on FIFO basis,

d) sharing (INIZIALIZZA FIFO WFQ-Q) the indicators (Q-ID) of said transmission queues awaiting to be served within a high priority list (HP-FIFO), a low priority list (LP-FIFO), and a very low priority list (VLP-FIFO), individually belonging to second groups of lists (WFQ-Q) managed on FIFO bases, associated to the functional blocks,

e) scanning, at cell interval ( $T_c$ ) and on the basis of tokens available, the lists of indicators (B-ID) of said first set (SERVI HP-FIFO, SERVI LP-FIFO, SERVI VLP-FIFO) for the emission of indicators (B-ID) selecting functional blocks ( $B_j$ ) having queues to serve,

f) scanning, at cell interval ( $T_c$ ) and on the basis of tokens available, the lists belonging to said second sets of lists (WFQ-Q) selected, for the emission of relevant indicators (Q-ID) of transmission queues ( $QU_j$ ) enabled to transmit a cell on the multiplexed flow (LINK-OUT), refer to Figures 1 and 2 and 3 and columns 5-9.

3. Regarding claim 3 – Daniele discloses said step to scan e) includes the following steps: reading (READ HP-FIFO) an indicator (B-ID) from a high priority list (HP-FIFO) and serve (SERVI HP-FIFO) the block indicated, ending the scanning (E HP-FIFO VUOTA) with the emptying of said high priority list, reading (READ LP-FIFO) an indicator (B-ID) from a low priority list (LP-FIFO) and serve (SERVI LP-FIFO) the block indicated, decreasing, when appropriate, the tokens available and transfer the indicator (B-ID) of the block that has finished its tokens inside a very low priority list (VLP-FIFO), ending the scanning (E LP-FIFO VUOTA) with the emptying of said low priority list, or with the end of the renewal period (TR), reading (READ VLP-FIFO) an indicator (B-ID) from a very low priority list (VLP-FIFO) and serve (SERVI VLP-FIFO) the block indicated, ending the scanning (E VLP-FIFO VUOTA) with the emptying of said very low priority list, or with the end of the renewal period (TR), refer to Figures 1 and 2 and 3 and columns 5-9.

4. Regarding claim 4 – Daniele discloses each said step to serve (SERVI HP-FIFO, SERVI LP-FIFO, SERVI VLP-FIFO) the blocks indicated in said lists having different priorities, also includes the step to reinsert one said block indicator (B-ID) in the origin list in case at least one cell to be transmitted is present in at least one queue (QUj) assigned to the selected block, refer to Figures 1-3 and columns 5-9 and claims 1-3.

5. Regarding claims 5 and 20 – Daniele discloses said connections having service classes of different quality include some for which the peak cell-rate is guaranteed, and therefore involve

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flows which have not the opportunity to avail of said additional band possibly available on the multiplexed flow (LINK-OUT), said flows having peak ceil-rate generating transmission queues allocated in a unique block that have service priority up to the emptying of the same, refer to Figure 1 and column 2 lines 18 to 22 and column 4 lines 1 to 15 and claims 4 and 10.

6. Regarding claims 6 and 21 – Daniele discloses where some of said connections are supported by flows of ATM cells that require a control of the peak band such to prevent that a given maximum band value within said multiplexed flow (LINK-OUT) is exceeded, characterized by the fact to have recourse to a first timing that expands the emission intervals of at least some said indicators (B-ID) of the functional blocks (Bj) to limit the aggregate peak band of the group of connections belonging to the selected blocks, refer to Figure 5 and column 10 lines 30 to 48.

7. Regarding claim 13 – Daniele discloses statistical multiplexer of flows of ATM cells originated by connections having service classes of different quality, said flows generating transmission queues of cells (QUj) shared in functional blocks selected for the service, and at least some of said flows being assigned a minimum guaranteed band on the multiplexed flow (LINK-OUT), and the possibility to share a residual band possibly available on the same flow, including:

- a) a storage buffer of said transmission queues (QUj) of ATM cells,
- b) means controlling the access to the buffer for the insertion or extraction of said cells,

c) counting means of the number of cells included in each one of said transmission queues,

d) execution means of a known technique, hereinafter called Weighted Fair Queuing, or WFQ, that dynamically assign opportune quantities of tokens, evaluated on statistical basis, to single transmission queues (QUj), spending said tokens to have access to the residual band on the multiplexed flow (LINK-OUT), characterized in that said execution means of the WFQ technique are modified (WFQ-CONTR, WFQ-B, WFQ-Q) in order to dynamically assign opportune quantities of tokens, evaluated on statistical basis, also to said functional blocks (Bi,...,Bm), that spend said tokens to enable their transmission queues (QUj) to have access to the sharing of the residual band on the multiplexed flow (LINK-OUT), thus sharing among said functional blocks (Bj) the residual band on the multiplexed flow, refer to Figure 1 and column 2 lines 18 to 22 and column 3 lines 33 to 45 and column 5 lines 5 to 37 and columns 6 and 7.

8. Regarding claim 14 – Daniele discloses modified execution means of the WFQ technique (WFQ-CONTR, WFQ-B, WFQ-Q) include:

a) a first storing structure (TK-CNT1,...,TK-CNTm) at disposal of each transmission queue (QUj) to store a relevant number of tokens ( $N^0\text{TK}(QU1), \dots, N^0\text{TK}(QUz)$ ) proportional to the band of the relevant said flows, said first storing structure (TK-CNT1,...,TK-CNTm) being used as set of counters,

b) a second storing structure (TK-CNT-B) at disposal of each one of said functional blocks (B1, ..., Bm) to store a relevant number of said tokens ( $N^0\text{TK}(B1), \dots, N^0\text{TK}(Bm)$ )



proportional to the aggregate band of the relevant component flows, said second storing structure (TK-CNT-B) that can be used as set of counters,

c) a first set of FIFO memories having different service priority (WFQ-B), that can be used to store the indicators (B-ID) of the functional blocks ( $B_i, \dots, B_m$ ),

d) second sets of FIFO memories having different service priority (WFQ-Q), that can be separately used to store the indicators (Q-ID) of the transmission queues ( $QU_j$ ) belonging to one said relevant functional block ( $B_j$ ),

e) a control unit (WFQ-CONTR) connected to the first (TK-CNT1, ..., TK-CNTm) and second (TK-CNT-B) storing structure reserved to the tokens, to said first (WFQ-B) and second sets of memories FIFO (WFQ-Q) reserved to the indicators, said control unit (WFQ-CONTR) being controlled by a program that assigns the relevant said quantity of tokens and regulates their consumption, refer to Figures 1 and 2 and 3 and columns 5-9.

9. Regarding claim 15 – Daniele discloses said first set of FIFO memories (WFQ-B) and each second set of FIFO memories (WFQ-Q) having different service priorities, individually include a high priority FIFO memory (HP-FIFO), a low priority FIFO memory (LP-FIFO), and a very low priority FIFO memory (VLP-FIFO), refer to Figure 1 and column 3 lines 33 to 55.

10. Regarding claim 16 – Daniele discloses said modified means for the execution of the WFQ technique (WFQ-CONTR, WFQ-B, WFQ-Q) include also a counter of the real time that is initialized by said control unit (WFQ-CONTR) with a pre-set value, decreasing at each cell time ( $T_c$ ), and therefore reinitialized after each reset, cyclically repeating the above mentioned steps;

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the real time counter being used by the control unit (WFQ-CONTR) to renew, at each initialization of the above mentioned counter, the writing of the initial number of said tokens reserved to the functional blocks ( $B_i, \dots, B_m$ ) and to the transmission queues ( $QU_j$ ), within the first (TK-CNTI, ..., TK-CNTm) and second (TK-CNTB) storing and count structure, respectively, refer to Figures 1-3 and columns 5-9.

11. Regarding claim 17 – Daniele discloses each initialization of said real-time counter, said control unit (WFQ-CONTR) renews its content of said high (HP-FIFO), low (LP-FIFO), and very low (VLP-FIFO) priority FIFO memories belonging to said first (WFQ-B) and second sets (WFQ-Q) of FIFO memories, refer to Figures 1-3 and columns 5-9.

12. Regarding claim 18 – Daniele discloses during each said renewal time ( $T_r$ ) said control unit (WFQ-CONTR) scans, at cell interval ( $T_c$ ) and on the basis of available tokens, said first set of memories FIFO (WFQ-B) for the emission of an indicator (B-ID) for the selection of a functional block ( $B_j$ ) having one queue at least to serve, refer to Figures 1-3 and columns 5-9.

13. Regarding claim 19 – Daniele discloses each said renewal time ( $T_r$ ) said control unit (WFQ-CONTR) scans, at cell time interval ( $T_c$ ) and on the basis of available tokens, one said second set of FIFO memories (WFQ-Q) associated to a functional block ( $B_j$ ) selected, for the emission of an indicator (Q-ID) of a transmission queue ( $QU_j$ ) enabled to transmit a cell on the multiplexed flow (LINK-OUT), refer to Figures 1-3 and columns 5-9.

***Allowable Subject Matter***

Claims 7-12 and 22-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Veres et al. (US 6,614,790 B1) discloses an architecture for integrated services packet-switched networks.
2. Wallmeier (US 6,553,033 B1) discloses a process for optimized transmission of ATM cells over connection elements.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Pezzlo whose telephone number is (571) 272-3090. The examiner can normally be reached on Monday to Friday from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

Any response to this action should be mailed to:

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For informal or draft communications, please label "PROPOSED" or "DRAFT"

Hand delivered responses should be brought to:


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John Pezzlo

24 March 2005



**JOHN PEZZLO**  
**PRIMARY EXAMINER**